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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/723,112
Filing Date: November 26, 2003
Appellant(s): CAMPBELL ET AL.

Mohammad S. Rahman
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 03/12/2007 appealing from the Office action mailed 10/19/2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,999,628 B1	PALMER	6-1999
7,039,641 B2	WOO	2-2001

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1 – 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Palmer et al. (Palmer hereinafter) (US Patent No. 6,990,628 B1, filed: June 14, 1999) as in view of Woo (US Patent No. 7,039,641 B2, filed: February 22, 2001).

Regarding Claims 1, 20, and 39, Palmer discloses a program storage device readable by computer, tangibly embodying a program of instructions executable by said

computer to perform a program storage device of extracting information, said program storage device comprising:

inputting a query (Col. 7, lines 30 – 32, Palmer);

searching a database of documents based on said query (Col. 7, lines 28 – 32, Palmer);

retrieving documents from said database based solely on whether said documents are relevant to said query (Col. 4, lines 11 – 19; "The sum of the distances for a document is a confidence value or score. In a directory engine, the confidence value or score characterizes the confidence that a particular document falls within a particular category. In a search engine, the confidence value or score characterizes the relevance of a particular document to a given query. Normally, the confidence value or score would be sorted or ranked, and documents would be placed in a result set and displayed to a user according to their confidence value or score"; Palmer). Wherein it is clear that the documents retrieved by the Palmer reference based solely on whether the documents are relevant to the query input (As shown in the citations above, Palmer retrieved documents based on the confidence value or score which was originally based solely on the query) using a plurality of classifiers (Col. 3, lines 1 – 3, Palmer).

Palmer discloses all the limitations as disclosed above. However, Palmer is silent with respect to a hierarchical cascade of classifier layers. On the other hand, Woo discloses classifiers arranged in a hierarchical cascade of classifier layers (Fig. 1, item

20, Col. 17, lines 44 – 49, Woo[1]). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the Woo' teachings to the system of Palmer. Skilled artisan would have been motivated to do so, as suggested by Woo (Col. 1, and 2, lines 63 – 67, and 1 – 2; respectively, "A more pragmatic approach is desired. In particular, it is desirable to be able to classify packets using a relatively large number of filters given the present state of packet arrival rates. Towards this end the invention seeks to provide a relatively efficient method and system for finding or identifying an applicable filter when a relatively large number of filters are employed in a packet classification system", Woo), to provide a relatively efficient method and system for finding or identifying an applicable filter when a relatively large number or filters are employed in a packet classification system. In addition, both of the references (Palmer and Woo) teach features that are directed to analogous art and they are directed to the same field of endeavor of database management system, such as, searching, classifying data, weights, and frequencies. This relation between both of the references highly suggests an expectation of success.

The combination of Palmer in view of Woo ("Palmer/Woo" hereinafter) further discloses classifiers (Col. 14, lines 23 – 26, categorization within the training set, Palmer; and Fig. 1, item 20, Col. 17, lines 44 – 49, Woo[2]) including weighted training data points (Col. 13, lines 62 – 66, Palmer[3]) comprising feature vectors representing any portion of a document (Col. 14, lines 31 – 35, Palmer), wherein each said feature vector is arranged only as a vector of counts for all features in a data point (Col. 14,

[1] Wherein the filters correspond to the classifiers claimed.

lines 31 – 35; each component of the feature vector is the normalized value of the **occurrence frequency or a particular feature** in this document, Palmer); and weighing an output from said cascade according to a rate of success of query terms being matched by each layer of said cascade , wherein said weighing is performed using a terminal classifier (Col. 16, lines 1 – 11, Palmer[4]; and Col. 5, lines 54 – 61, Woo[5]).

Regarding Claims 2, 21, and 40, Palmer/Woo discloses a program storage device, wherein each classifier accepts an input distribution of data points (Col. 5, lines 41 – 45, input k-tuple t, See also Col. 9, lines 18 – 21, "Many different criteria can be defined for the division. An embodiment presented below takes into account the filter usage statistics, thus allowing it to adapt to the distribution of input traffic", Woo) and transforms said input distribution to an output distribution of said data points (Fig. 8, item 72, Col. 5 and 15, lines 41 – 45 and 20 – 21, returns the first F*i* and ouput stage; respectively, Woo).

Regarding Claims 3, 22, and 41, Palmer/Woo discloses a program storage device, wherein each classifier is trained by weighing training data points at each classifier layer in said cascade by an output distribution generated by each previous classifier layer (Fig. 8, item 72, Col. 5 and 15, lines 41 – 45 and 20 – 21, returns the first

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[2] Wherein the filters correspond to the classifiers claimed.
[3] Wherein the training set corresponds to the weighted training data points claimed.
[4] Wherein examiner interprets the confidence score as the rate of success claimed; and the β category as the terminal classifier claimed.

F*i* and ouput stage; respectively, Woo), and wherein weights of said training data points of said first classifier layer are uniform (Col. 5, lines 54 – 57, "The weight represents the relative match frequency of a particular filter, and is typically derived from the distribution of the input tuple t or filter usage statistics", Woo).

Regarding Claims 4, 23, and 42, Palmer/Woo discloses a program storage device, wherein each classifier is trained according to said query input (Col. 4, lines 11 – 19; "...the confidence value or score characterizes the confidence that a particular document falls within a particular category. In a search engine, the confidence value or score characterizes the relevance of a particular document to a given query. Normally, the confidence value or score would be sorted or ranked, and documents would be placed in a result set and displayed to a user according to their confidence value or score"; Palmer; and Col. 11, lines 46 – 48, Woo[6]).

Regarding Claims 5, 24, and 43, Palmer/Woo discloses a program storage device, wherein said query input is based on a minimum number of example documents (Col. 13, lines 62 – 67, "FIG. 3B is a block diagram of steps that may be involved in an embodiment of Data Preparation step 302. In block 310, a training set is created. The training set comprises a small set of electronic documents that are determined to closely match each category of a taxonomy", Woo).

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[5] Wherein examiner interprets *prob(*Fi is the best matching filter for t) as the rate of success claimed.
[6] Wherein examiner interprets the step of matching the filters to the input packet as the step where each classifier is trained according to the query input claimed. Wherein the input bit (further disclosed as "selection criteria" in Col. 11, lines 53 – 55, Woo) corresponds to the query input claimed.

Regarding Claims 6, 25, and 44, Palmer/Woo discloses a program storage device, wherein said document comprises data points comprising feature vectors representing any portion of said document (Col. 14, lines 31 – 35, Palmer; and Col. 14, lines 31 – 35, feature vectors, Woo).

Regarding Claims 7, 26, and 45, Palmer/Woo discloses a program storage device, wherein said documents comprise a file format capable of being represented by said feature vectors (Col. 14, lines 31 – 35, Palmer[7]).

Regarding Claims 8, 27, and 46, Palmer/Woo discloses a program storage device, wherein said documents comprise any of text files, images, web pages, video files, and audio files (Col. 3 and 5 – 6, lines 57 – 62, and 65 – 67 and 1- 3; "A Similarity may also include equivalent images audio components, or other multimedia elements. A Similarity may include equivalent component parts of URLs. A Similarity also may be based on user click information; for example, if one document is selected or clicked on often, from or following another document, then the process may determine that the documents are similar", and "...a crawler of a hypertext search system identifies each multimedia component in an electronic document. The crawler compresses each component into a feature vector that uniquely represents its contents. The similarity of

[7] Examiner interprets that if feature vectors can be constructed for each document, then it is implied that the format of these documents/or files can be represented in such feature vectors.

two documents is determined by comparing the values of the feature vectors of the multimedia components they contain", Palmer).

Regarding Claims 9, 28, and 47, Palmer/Woo discloses a program storage device, wherein a classifier at each layer in said hierarchical cascade is trained for each layer with an expectation maximization methodology that maximizes a likelihood of a joint distribution of said training data points and latent variables (Col. 9, lines 16 – 21, minimize duplication and maximize "balancedness", Woo[8]).

Regarding Claims 10, 29, and 48, Palmer/Woo discloses a program storage device, wherein each layer of said cascade of classifiers is trained in succession from a previous layer by said expectation maximization methodology, wherein said output distribution is used as an input distribution for a succeeding layer (Fig. 8, item 68a, 70a, 68b, 70b, Col. 15, lines 15 – 19, Woo).

Regarding Claims 11, 30, and 49, Palmer/Woo discloses a program storage device, wherein each layer of said cascade of classifiers is trained by successive iterations of said expectation maximization methodology until a convergence of parameter values associated with said output distribution of each layer occurs in succession (Fig. 4, item 406 and 410, Col. 16, lines 51 – 55, Palmer[9]).

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[8] Wherein the distribution of input traffic corresponds to the join distribution claimed.

Regarding Claims 12, 31, and 50, Palmer/Woo discloses a program storage device, wherein said successive iterations comprise a fixed number of iterations (Fig. 4, item 406 and 410, Col. 16, lines 51 – 55, "In one embodiment, the classification confidence vectors are represented as X(j, k)=1 if page k is a training document that belongs to category j; otherwise the vector element is set equal to In block 406, a loop is entered to carry out training iterations. A counter variable i is initialized to "0". Block 406 also involves testing whether the value of i is less than a pre-determined maximum. If not, then training is complete, and the output is written to storage, as indicated by block 408.", wherein the categories correspond to classifiers claimed and wherein the training iterations correspond to the iterations claimed; Palmer[10]).

Regarding Claims 13, 32, and 51, Palmer/Woo discloses a program storage device, wherein all layers of said cascade of classifiers are trained by successive iterations of said expectation maximization methodology until a convergence of parameter values associated with output distributions of all layers occurs (Fig. 4, item 406 and 410, Col. 16, lines 51 – 55, Palmer[11]), wherein during each step of the of said iterations, the output distribution of each layer is used to weigh the input distribution of a succeeding layer (Col. 16, lines 59 – 62, Palmer[12]; and Fig. 8, item 68a, 70a, 68b, 70b, Col. 15, lines 15 – 19, Woo).

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[9] Wherein the pre-determined maximum corresponds to convergence parameter of values claimed.
[10] The iterations, that include a pre-determined number used for testing, imply a fixed number of iterations as claimed.
[11] Wherein the pre-determined maximum corresponds to convergence parameter of values claimed.
[12] Wherein the current value of x(j, k) corresponds to the output distribution claimed; and the buffer x'(k) corresponds to the input distribution claimed.

Regarding Claims 14, 33, and 52, Palmer/Woo discloses a program storage device, wherein said successive iterations comprise a fixed number of iterations (Fig. 4, item 406 and 410, Col. 16, lines 51 – 55, Palmer[13]).

Regarding Claims 15, 35, and 53, Palmer/Woo discloses a program storage device, wherein each classifier layer generates a relevancy score associated with each a data point, wherein said relevancy score comprises an indication of how closely matched said data point is to said example documents (Col. 4 and 16, lines 11 – 16 and 13 – 18; respectively, wherein the confidence score corresponds to the relevancy score claimed; Palmer; and Abstract, Woo).

Regarding Claims 16, 37, and 54, Palmer/Woo discloses a program storage device, wherein each classifier layer generates a relevancy score associated with said document, wherein said relevancy score is calculated from relevancy scores of individual data points within said document (Col. 4, lines 14 – 16, confidence value or score characterizes the relevance of a particular document to a given query, Palmer).

Regarding Claims 17, 36, and 55, Palmer/Woo discloses a program storage device, wherein said terminal classifier generates a relevancy score associated with each data point, wherein said relevancy score comprises an indication of how closely

matched said data point is to said example documents (Col. 4, lines 11 – 16, Palmer), and wherein said relevancy score is computed by combining relevancy scores generated by classifiers at each layer of the cascade (Col. 12, lines 22 – 28, Palmer).

Regarding Claims 18, 34, and 56, Palmer/Woo discloses a program storage device, wherein said terminal classifier generates a relevancy score associated with a document, wherein said relevancy score is calculated from relevancy scores of individual data points within said document (Col. 4, lines 14 – 16, Palmer).

Regarding Claims 19, 38, and 57, Palmer/Woo discloses a program storage device, wherein features of said feature vectors comprise words within a range of words located proximate to entities of interest in said document (Col. 14, lines 29 – 35, Wherein examiner interprets one-half million word phrases out of two million features corresponds to the words within a range claimed and wherein the step of selecting documents in one category corresponds to the step of locating proximate to entities as claimed, Palmer).

[13] The iterations, that include a pre-determined number used for testing, imply a fixed number of iterations as claimed.

(10) Response to Argument

1. Independent claims 1, 20, and 39

In response to appellant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Appellant argues that the prior art fails to disclose; "classifiers are operable to retrieve documents from said database based solely on whether said documents are relevant to said query input", and points out that; "Palmer's invention does not take into account the user query"; and further states that in Appellant's claimed invention; " documents are retrieved based solely on whether they are relevant to the query input".

Examiner respectfully disagrees. The combination of Palmer in view of Woo does disclose; classifiers are operable to retrieve documents from said database based solely on whether said documents are relevant to said query input (Col. 4, lines 11 – 19; "The sum of the distances for a document is a confidence value or score. In a directory engine, the confidence value or score characterizes the confidence that a particular document falls within a particular category. In a search engine, the confidence value or

score characterizes the relevance of a particular document to a given query. Normally, the confidence value or score would be sorted or ranked, and documents would be placed in a result set and displayed to a user according to their confidence value or score"; Palmer). Wherein it is clear that the documents retrieved by the Palmer reference based solely on whether the documents are relevant to the query input (As shown in the citations above, Palmer retrieved documents based on the confidence value or score which was originally based solely on the query); and wherein the given query corresponds to the query input claimed. Additionally, the Examiner makes note that the Appellant's main argument relies on the limitation "based solely on whether they are relevant to the query input; however, the Examiner hasn't found support in the Specification and/or Drawings of the disclosure for the limitation "based solely on whether they are relevant to the query input". For example, page 23, lines 22 – 23; page 24, lines 15 to page 25, line 3, of the specification of the disclosure (as cited by Appellant in the section "Summary of Claimed Subject Matter" to support the limitation "...based solely on...") do not specifically disclose that documents are retrieved "solely" (and/ or excluding or ignoring any other information) on whether they are relevant to the query input.

In response to appellant's argument that Palmer and Woo are nonanalogous art, that they are not in same field, and that the USPTO has classified Palmer and Woo in different classes, it has been held that a prior art reference must either be in the field of appellant's endeavor or, if not, then be reasonably pertinent to the particular problem

with which the appellant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, the references Palmer and Woo are not only both classified under same class 707 Databases (Palmer class 707 subclass 3, and Woo class 707 subclass 100), but also are pertinent to the problem with which the appellant was concerned and are in the field of appellant's endeavor, such as, for example, classifying (Col. 3, lines 1 – 3, "...in combination with a comparison of a set of pre-classified training set of documents with a set of unclassified documents, to carry out classification...", Palmer; and Abstract and Col. 3, lines 27 – 29, "...identifying a filter used to classify a packet having at least one corresponding field of interest...", Woo), searching (Col. 6, lines 45 – 52, "The user may use a search engine to obtain a set of search results from the Base Set. The search results comprise a list of documents that contain the words in the query, and may comprise a brief summary or abstract of each document. Normally the list of documents includes a hyperlink to each document in the list", Palmer; and Col. 7, lines 52 – 60, "Speed of Classification. The speed of classification is determined by the number of search steps and the operation performed at each search step. There are at least 3 measures for the speed of classification: (i) the "worst case" search time possible for a packet; (ii) the "average case" search time possible for completely random collection of packets; and (iii) "statistical", being the average case search time for packets drawn from some a priori specified packet or filter usage distribution"; Woo), weights (Col. 5, lines 10 – 17, "Accordingly, the preferred embodiment implements a process called "multivariable link analysis". The weight

ascribed to one category is dictated in part by the weight ascribed to a second category.", Palmer; and Col. 5, lines 53 – 57, "A simple extension to the classification problem is to associate each filter Fi with a weight Wi. The weight represents the relative match frequency of a particular filter, and is typically derived from the distribution of the input tuple t or filter usage statistics.", Woo).

In response to appellant's argument that "Woo in combination with Palmer would result in an inoperable device/method producing conflicting results", the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

Appellants arguments are often directed to the comparison of the prior art and appellant's disclosure, such as, for example, "...Woo's invention by passes a large number of filters yet still provides an answer as is all the filters have been consulted (column 1, line 66 to column 2, line 2). This is only possible if all the filters make yes-no (i.e. zero or one) decisions; conversely in the Appellants' invention the classifiers in text information retrieval inherently keep weights or probabilities which are not zero or one...". Examiner makes note that "inherently keep weights or probabilities which are not zero or one..." is not recited in the rejected claims. Although the claims are

interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). USPTO personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure. In re Morris, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim should not be read into the claim. E-Pass Techs., Inc. v. 3Com Corp., 343 F.3d 1364, 1369, 67 USPQ2d 1947, 1950 (Fed. Cir. 2003) (claims must be interpreted "in view of the specification" without importing limitations from the specification into the claims unnecessarily). In re Prater, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-551 (CCPA 1969). See also In re Zletz, 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989) ("During patent examination the pending claims must be interpreted as broadly as their terms reasonably allow.... The reason is simply that during patent prosecution when claims can be amended, ambiguities should be recognized, scope and breadth of language explored, and clarification imposed.... An essential purpose of patent examination is to fashion claims that are precise, clear, correct, and unambiguous.
Only in this way can uncertainties of claim scope be removed, as much as possible, during the administrative process.").

In response to appellant's argument that there is no suggestion to combine the references Palmer and Woo, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the

claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, and as stated in the Final Office Action dated 10/12/2006, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the Woo' teachings to the system of Palmer, to provide a relatively efficient method and system for finding or identifying an applicable filter when a relatively large number or filters are employed in a packet classification system (Col. 1, and 2, lines 63 – 67, and 1 – 2; respectively, "A more pragmatic approach is desired. In particular, it is desirable to be able to classify packets using a relatively large number of filters given the present state of packet arrival rates. Towards this end the invention seeks to provide a relatively efficient method and system for finding or identifying an applicable filter when a relatively large number of filters are employed in a packet classification system", Woo).

Appellant argues that; "There is no basis in either Woo or any other prior art reference or by the vernacular used those skilled in the art that uses "minimize duplication" and "maximize balacedness" to be analogous to an "expectation maximization methodology"

Examiner respectfully disagrees. First, Examiner makes note that such limitation is not recited in any of the independent claims 1, 20, 39. In fact, such limitation is further discussed in this Office Action below. Second, as stated in the Final Office Action dated

10/12/2006, the combination of Palmer in view of Woo does disclose an expectation maximization methodology that maximizes a likelihood of a joint distribution of said training data points and latent variables (Col. 9, lines 16 – 21, minimize duplication and maximize "balancedness"; Wherein the distribution of input traffic corresponds to the join distribution claimed, Woo). Additionally, the Examiner makes note that the "expectation maximization methodology" recited in claims 9, 28, and 47 is disclosed in the background of the Specification of Appellant's disclosure as an methodology well-known in the art (Paragraph [0008] of the specification of the disclosure, "In particular, finite mixture models, whose parameters are learned using the popular expectation maximization (EM) methodology, are used extensively.", Specification of Appellant's disclosure).

Appellant argues that *prima facie* case of obviousness has not been established.

Examiner respectfully disagrees. As previously stated in the Final Office Action dated 10/12/2006, according to MPEP § 2142, to establish *prima facie* case of obviousness three basic criteria must be met. **First**, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings. The prior art discloses a suggestion for combining the references (Col. 1, and 2, lines 63 – 67, and 1 – 2; respectively, "A more pragmatic approach is desired. In particular, it is desirable to be able to classify packets using a relatively large number of filters given the present state of packet arrival rates. Towards this end the invention

seeks to provide a relatively efficient method and system for finding or identifying an applicable filter when a relatively large number of filters are employed in a packet classification system", Woo).

As suggested by Woo, skilled artisan would have been motivated to make such combination, to classify packets using relatively large number of filters and to provide a relatively efficient method and system for finding or identifying an applicable filter when a relatively large number or filters are employed in a packet classification system.

Second, there must be a reasonable expectation of success. The prior art suggests a successful outcome of this combination, such as, an efficient method and system for finding or identifying an applicable filter. **Third**, both of the references (Palmer and Woo) teach features that are directed to the same industry field, such as, searching, classifying data, weights, and frequencies. This close relation between both of the references highly suggests an expectation of success. Finally, the combination of Palmer in view of Woo discloses all the claim limitations disclosed in the claimed invention (see- citations of claims 1 – 57 above).

2. Dependent claims 2, 21, and 40

Appellant argues that the prior art fails to disclose; "input distribution" and "output distribution".

Examiner respectfully disagrees. As stated in office action dated 10/12/2006, the combination of Palmer in view of Woo does disclose input distribution (Col. 5, lines 41 – 45, input k-tuple t, See also Col. 9, lines 18 – 21, "Many different criteria can be defined

for the division. An embodiment presented below takes into account the filter usage statistics, thus allowing it to adapt to the distribution of input traffic", Woo) and output distribution (see - Fig. 8, item 72, Col. 5 and 15, lines 41 – 45 and 20 – 21, returns the first F*i* and ouput stage; respectively, Woo). Wherein the examiner interprets the input tuples k-tuples t as the input distribution claimed; and the first F*i* returned as the output distribution claimed. As known in the art of Database management systems, a tuple is a set of values and/or a row of data elements in a relation, equivalent to a record. Then, the Examiner has interpreted an input distribution to be the input tuple claimed because the tupe is distributed in a row or record, which in this case are input values of this tuple. Same reasoning applies to the output distribution.

3. Dependent claims 3, 22, and 41

Appellant argues that the prior art fails to disclose; "wherein weights of said training data points of said first classifier layer are uniform".

Examiner respectfully disagrees. The combination of Palmer in view of Woo does disclose: wherein weights of said training data points of said first classifier layer are uniform (Col. 5, lines 54 – 57, "The weight represents the relative match frequency of a particular filter, and is typically derived from the distribution of the input tuple t or filter usage statistics", Woo). Wherein the Examiner interprets that since the weight is represents the match frequency of a particular filter, the weight is uniform. Wherein the particular filter corresponds to the first classifier layer claimed.

4. Dependent claims 4, 23, and 42

Appellant argues that the prior art fails to disclose; "each classifier is trained according to said query input ".

Examiner respectfully disagrees. The combination of Palmer in view of Woo does disclose: each classifier is trained according to said query input (Col. 11, lines 46 – 48, Woo). Wherein examiner interprets the step of matching the filters to the input packet as the step where each classifier is trained according to the input. Wherein the input bit (further disclosed as "selection criteria" in Col. 11, lines 53 – 55, Woo) corresponds to the input. Also, Examiner points out to the Appellant that the claimed invention has been rejected under a combination of references. Wherein the query input is more explicitly and more detailed disclosed by Palmer (Col. 4, lines 11 – 19; "The sum of the distances for a document is a confidence value or score. In a directory engine, the confidence value or score characterizes the confidence that a particular document falls within a particular category. In a search engine, the confidence value or score characterizes the relevance of a particular document to a given query. Normally, the confidence value or score would be sorted or ranked, and documents would be placed in a result set and displayed to a user according to their confidence value or score"; Palmer).

5. Dependent claims 5, 24, and 43

Appellant argues that the prior art fails to disclose; "said query input is based on a minimum number of example documents".

Examiner respectfully disagrees. The combination of Palmer in view of Woo does disclose: said query input is based on a minimum number of example documents (Col. 13, lines 62 – 67, "FIG. 3B is a block diagram of steps that may be involved in an embodiment of Data Preparation step 302. In block 310, a training set is created. The training set comprises a small set of electronic documents that are determined to closely match each category of a taxonomy", Woo).

6. Dependent claims 6, 24, and 44

Appellant argues that; "This language of Palmer merely suggests that feature vectors are constructed for each document. It does not indicate that the feature vectors represent any portion of the document".

Examiner respectfully disagrees. The combination of Palmer in view of Woo does disclose: that the feature vectors represent any portion of the document (Col. 14, lines 31 – 35, "For example, based on two million features, about one-half million most discriminative features or word phrases may be chosen. As shown in block 316, word vectors or feature vectors are constructed for each document in the expanded set. Each component of the feature vectors is the normalized value of the occurrence frequency of a particular feature in this document", wherein, as cited, each component of the feature vectors are the value of the occurrence feature in such documents, which implies that those component represent any portion of the document as claimed, Palmer; and Col. 14, lines 31 – 35, feature vectors, Woo).

7. Dependent claims 7, 25, and 45

Appellant argues that; "This language of Palmer merely suggests that feature vectors are constructed for each document. It does not indicate what the characteristics are of the document".

Examiner respectfully disagrees. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., "what the characteristics are of the document") are not recited in the rejected claims 7, 25, and 45. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

8. Dependent claims 8, 26, and 46

Appellant argues that the applied prior art fails to disclose; "that the document itself includes images, audio components, or other multimedia elements".

Examiner respectfully disagrees. First, in response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the document itself includes images, audio components, or other multimedia elements) are not recited in the rejected claim 8, 26, and 46. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Second, the combination of Palmer in view of Woo does disclose the limitation of claims 8, 26, and 46 of: said documents comprise any of text files, images, web pages, video files, and audio files (Col. 3 and 5 – 6, lines 57 – 62, and 65 – 67 and 1- 3; "A Similarity may also include equivalent images audio components, or other multimedia elements. A Similarity may include equivalent component parts of URLs. A Similarity also may be based on user click information; for example, if one document is selected or clicked on often, from or following another document, then the process may determine that the documents are similar", and "...a crawler of a hypertext search system identifies each multimedia component in an electronic document. The crawler compresses each component into a feature vector that uniquely represents its contents. The similarity of two documents is determined by comparing the values of the feature vectors of the multimedia components they contain", Palmer).

9. Dependent claims 9, 28, and 47

Appellant argues that; "the Examiner is not reading the claims in their totality (i. e. as a whole), but rather is arbitrarily selecting portions of the claims and attempting to create a link to portions of the prior art in a piecemeal manner".

Examiner respectfully disagrees. The Examiner has read the claims in their totality and has interpreted the claims in view of the Specification of the disclosure without importing limitations from the specification into the claims unnecessarily. Additionally, Examiner makes note that the "expectation maximization methodology" recited in claims 9, 28, and 47 is disclosed in the background of the Specification of

Appellant's disclosure as an methodology well-known in the art (Paragraph [0008] of the specification of the disclosure, "In particular, finite mixture models, whose parameters are learned using the popular expectation maximization (EM) methodology, are used extensively.", Specification of Appellant's disclosure).

10. Dependent claims 10, 29, and 48

Appellant argues that; "There is nothing in this language which refers to or even suggests an expectation maximization methodology or its equivalence, let alone using an expectation maximization methodology to train each layer of a cascade of classifiers or filter".

Examiner respectfully disagrees. As stated in the Final Office Action dated 10/12/2006, the combination of Palmer in view of Woo does disclose an expectation maximization methodology that maximizes a likelihood of a joint distribution of said training data points and latent variables (Col. 9, lines 16 – 21, minimize duplication and maximize "balancedness"; Wherein the distribution of input traffic corresponds to the join distribution claimed, Woo). Additionally, and as discussed above, Examiner makes note that the "expectation maximization methodology" recited in claims 9, 28, and 47 is disclosed in the background of the Specification of Appellant's disclosure as an methodology well-known in the art (Paragraph [0008] of the specification of the disclosure, "In particular, finite mixture models, whose parameters are learned using the popular expectation maximization (EM) methodology, are used extensively.", Specification of Appellant's disclosure).

11. Dependent claims 11, 30, and 49

Appellant argues that; "there is no teaching in Palmer of the Appellant's 'wherein each layer of said cascade of classifiers is trained by successive iterations of said

expectation maximization methodology until a convergence of parameter values associated with said output distribution of each layer occurs in succession, ' especially considering that page 3 of the Office Action admits that Palmer does not teach cascade of classifier layer".

Examiner respectfully disagrees. As disclosed in Page 3 of the Final Office Action, the rejections of claims 1 – 57 are made under a 103 combination of references, wherein appellant cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

However, to further clarify, the Examiner points out to Page 3, lines 15 – 16, where the Office Action shows that Palmer discloses the plurality of classifiers. Then the combination of Palmer in view of Woo does disclose the claimed limitation of: each layer of said cascade of classifiers is trained by successive iterations of said expectation maximization methodology until a convergence of parameter values associated with said output distribution of each layer occurs in succession (Fig. 4, item 406 and 410, Col. 16, lines 51 – 55, Wherein the pre-determined maximum corresponds to convergence parameter of values claimed, Palmer).

12. Dependent claims 12, 31, and 50

Appellant argues that; "the Appellant's iterations are non-analogous to Palmer's counter variable because Palmer's counter variable has nothing to do with an

expectation maximization methodology, whereas the Appellant's iterations are iterations of an expectation methodology".

Examiner respectfully disagrees. The iterations taught in the combination of Palmer in view of Woo do correspond to Appellant's iterations. The reason is that, as disclosed by Palmer, the iteration are related and have to do with the classifiers (Col. 16, lines 50 – 57, "In one embodiment, the classification confidence vectors are represented as X(j, k)=1 if page k is a training document that belongs to category j; otherwise the vector element is set equal to In block 406, a loop is entered to carry out training iterations. A counter variable i is initialized to "0". Block 406 also involves testing whether the value of i is less than a pre-determined maximum. If not, then training is complete, and the output is written to storage, as indicated by block 408.", wherein the categories correspond to classifiers claimed and wherein the training iterations correspond to the iterations claimed; Palmer). And as disclosed by Woo, the classifiers are related and have to do with the expectation methodology (Col. 9, lines 10 – 21, "The filters in each group are then organized in a 2m-ary search tree 32. The search tree is constructed by examining m bits of the filters at a time, and dividing them into 2m groups. The particular m bits chosen for examination in each step can be drawn from any m arbitrary unexamined bit positions from any of the dimensions, and the choice is made to minimize duplication and maximize "balancedness" of the 2m children. Many different criteria can be defined for the division.", wherein the filters correspond to the classifiers claimed; and minimize duplication and maximize "balancedness" correspond to the expectation maximization methodology claimed; the

Woo). Therefore, since the classifier were one of the main reasons for combination of the references Palmer and Woo, then the counter variable has to do with an expectation maximization methodology.

13. Dependent claims 13, 32, and 51

Appellant argues again that; "the Appellant's iterations are non-analogous to Palmer's counter variable because Palmer's counter variable has nothing to do with an expectation maximization methodology, whereas the Appellant's iterations are iterations of an expectation methodology".

Examiner respectfully disagrees. The iterations taught in the combination of Palmer in view of Woo do correspond to Appellant's iterations. The reason is that, as disclosed by Palmer, the iteration are related and have to do with the classifiers (Col. 16, lines 50 – 57, "In one embodiment, the classification confidence vectors are represented as X(j, k)=1 if page k is a training document that belongs to category j; otherwise the vector element is set equal to In block 406, a loop is entered to carry out training iterations. A counter variable i is initialized to "0". Block 406 also involves testing whether the value of i is less than a pre-determined maximum. If not, then training is complete, and the output is written to storage, as indicated by block 408.", wherein the categories correspond to classifiers claimed and wherein the training iterations correspond to the iterations claimed; Palmer). And as disclosed by Woo, the classifiers are related and have to do with the expectation methodology (Col. 9, lines 10 – 21, "The filters in each group are then organized in a 2m-ary search tree 32. The

search tree is constructed by examining m bits of the filters at a time, and dividing them into 2m groups. The particular m bits chosen for examination in each step can be drawn from any m arbitrary unexamined bit positions from any of the dimensions, and the choice is made to minimize duplication and maximize "balancedness" of the 2m children. Many different criteria can be defined for the division.", wherein the filters correspond to the classifiers claimed; and minimize duplication and maximize "balancedness" correspond to the expectation maximization methodology claimed; the Woo). Therefore, since the classifier were one of the main reasons for combination of the references Palmer and Woo, then the counter variable has to do with an expectation maximization methodology.

14. Dependent claims 14, 33, and 51

Appellant argues again that; "the Appellant's iterations are non-analogous to Palmer's counter variable because Palmer's counter variable has nothing to do with an expectation maximization methodology, whereas the Appellant's iterations are iterations of an expectation methodology".

Examiner respectfully disagrees. The iterations taught in the combination of Palmer in view of Woo do correspond to Appellant's iterations. The reason is that, as disclosed by Palmer, the iteration are related and have to do with the classifiers (Col. 16, lines 50 – 57, "In one embodiment, the classification confidence vectors are represented as X(j, k)=1 if page k is a training document that belongs to category j; otherwise the vector element is set equal to In block 406, a loop is entered to carry out

training iterations. A counter variable i is initialized to "0". Block 406 also involves testing whether the value of i is less than a pre-determined maximum. If not, then training is complete, and the output is written to storage, as indicated by block 408.", wherein the categories correspond to classifiers claimed and wherein the training iterations correspond to the iterations claimed; Palmer). And as disclosed by Woo, the classifiers are related and have to do with the expectation methodology (Col. 9, lines 10 – 21, "The filters in each group are then organized in a 2m-ary search tree 32. The search tree is constructed by examining m bits of the filters at a time, and dividing them into 2m groups. The particular m bits chosen for examination in each step can be drawn from any m arbitrary unexamined bit positions from any of the dimensions, and the choice is made to minimize duplication and maximize "balancedness" of the 2m children. Many different criteria can be defined for the division.", wherein the filters correspond to the classifiers claimed; and minimize duplication and maximize "balancedness" correspond to the expectation maximization methodology claimed; the Woo). Therefore, since the classifier were one of the main reasons for combination of the references Palmer and Woo, then the counter variable has to do with an expectation maximization methodology.

15. Dependent claims 15, 34, and 52

Appellant argues that; "there is nothing in the above language of Palmer that teaches or reasonably suggest that each classifier or filter layer generates the relevancy score, which Appellant's provide".

Examiner respectfully disagrees. The combination of Palmer in view of Woo does disclose: each classifier generates the relevancy score (Col. 4 and 16, lines 11 – 16 and 13 – 18; respectively, wherein the confidence score corresponds to the relevancy score claimed; Palmer; and Abstract, Woo).

16. Dependent claims 16, 35, and 53

Appellant again argues that; "there is nothing in the above language of Palmer that teaches or reasonably suggest that each classifier or filter layer generates the relevancy score, which Appellant's provide".

Examiner respectfully disagrees. The combination of Palmer in view of Woo does disclose: each classifier generates the relevancy score (Col. 4 and 16, lines 11 – 16 and 13 – 18; respectively, wherein the confidence score corresponds to the relevancy score claimed; Palmer; and Abstract, Woo).

17. Dependent claims 17, 36, and 54

Appellant again argues that; "there is nothing in the above language of Palmer that teaches or reasonably suggest that each classifier or filter layer generates the relevancy score, which Appellant's provide".

Examiner respectfully disagrees. The combination of Palmer in view of Woo does disclose: each classifier generates the relevancy score (Col. 4 and 16, lines 11 – 16 and 13 – 18; respectively, wherein the confidence score corresponds to the relevancy score claimed; Palmer; and Abstract, Woo).

18. Dependent claims 18, 37, and 55

Appellant again argues that; "there is nothing in the above language of Palmer that teaches or reasonably suggest that each classifier or filter layer generates the relevancy score, which Appellant's provide".

Examiner respectfully disagrees. The combination of Palmer in view of Woo does disclose: each classifier generates the relevancy score (Col. 4 and 16, lines 11 – 16 and 13 – 18; respectively, wherein the confidence score corresponds to the relevancy score claimed; Palmer; and Abstract, Woo).

19. Dependent claims 19, 38, and 56

In arguing the limitation of claims 19, 38, and 56, Appellant mentions that; "nothing in the above quoted language in Palmer refers to the one-half million most discriminative feature or word phrases being located proximate to entities of interest in the document".

Examiner respectfully disagrees. First, in response to appellant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., "one-half million most discriminative feature or word phrases being located proximate to entities of interest in the document") are not recited in the rejected claims 19, 38, and 56. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Second, the combination of Palmer in view of Woo does disclose the claimed limitation; "wherein features of said feature vectors comprise words within a range of words located proximate to entities of interest in said document (Col. 14, lines 29 – 35, Wherein examiner interprets one-half million word phrases out of two million features corresponds to the words within a range claimed and wherein the step of selecting documents in one category corresponds to the step of locating proximate to entities as claimed, Palmer).

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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An appeal conference was held on 13 June 2007, and it was agreed to proceed to the board of appeals.